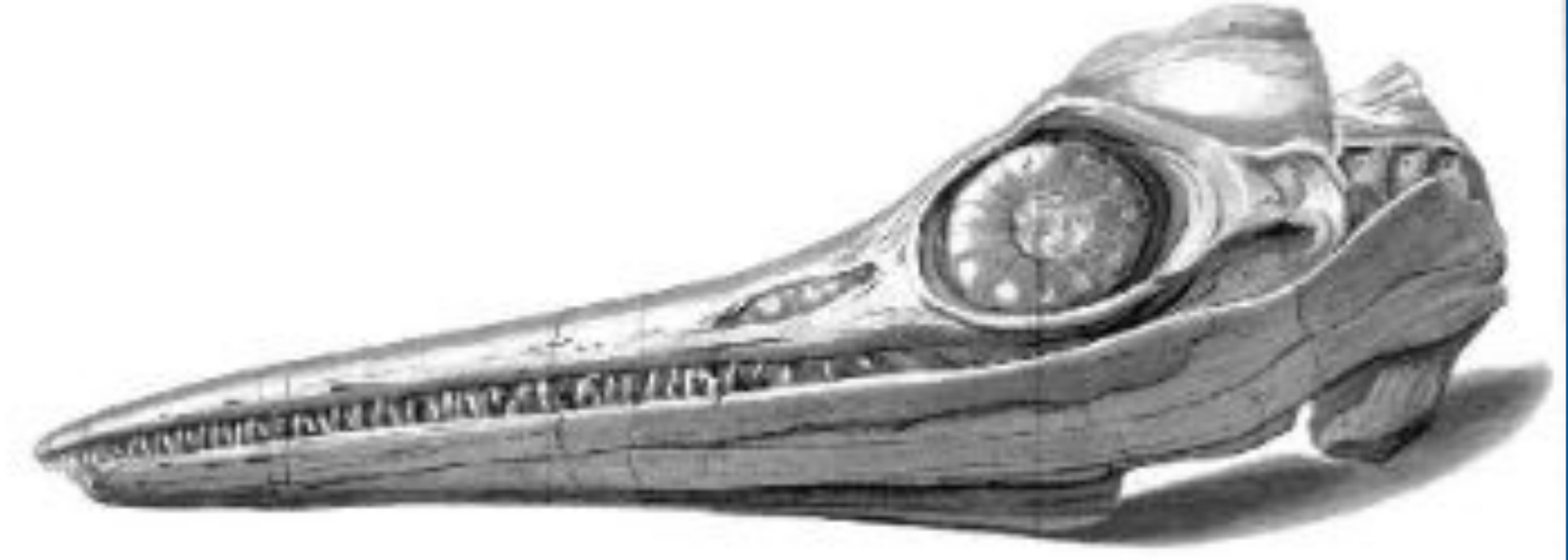


Variations³

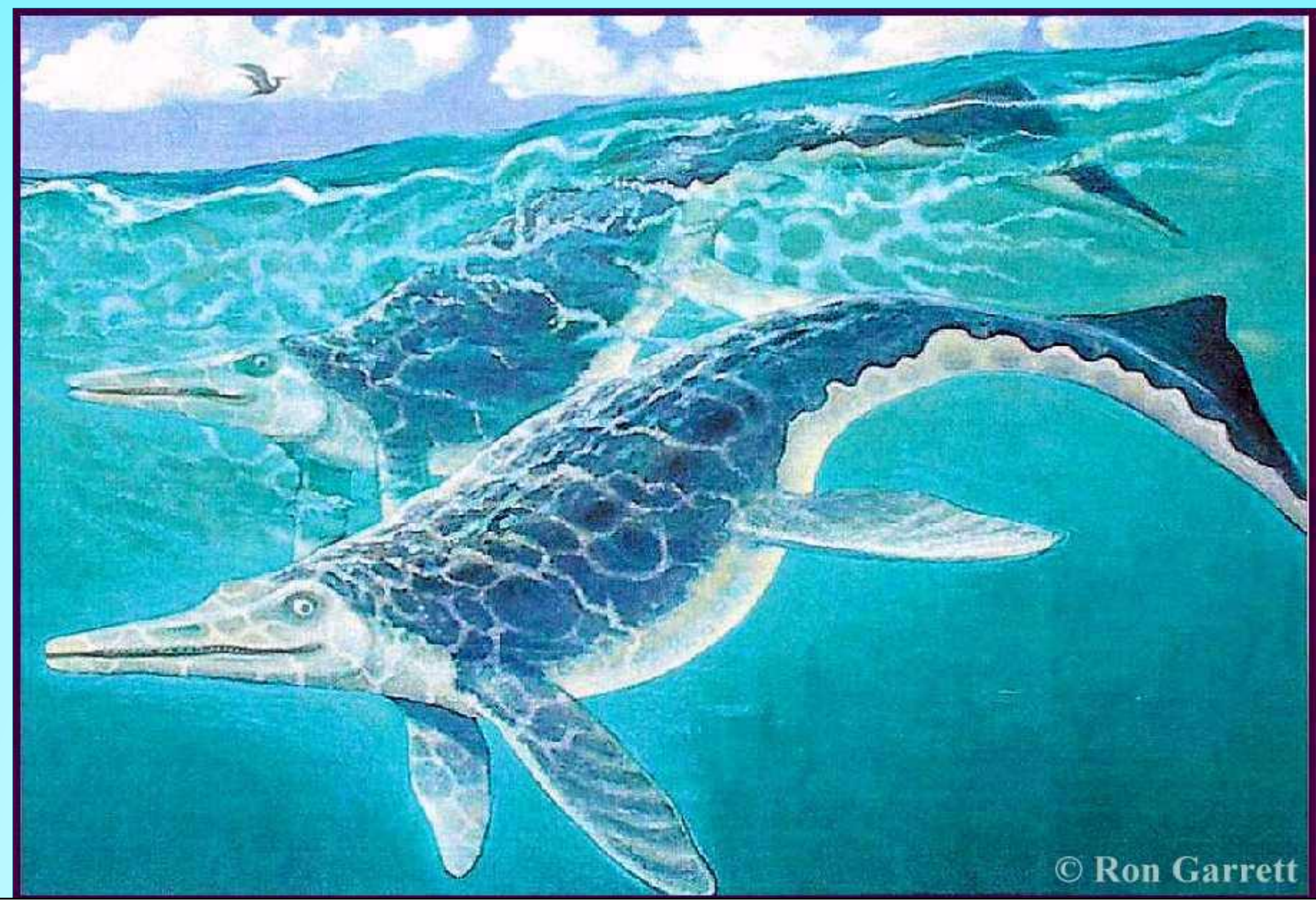
- Postcranial “kink” in tail
- Basal Ichthyosaurs - caudal peak
- Fish-shaped Ichthyosaurs - bending becomes steep forming a tailbend
- Teeth - mound-shaped, sometimes with ridges on the top of the crown
- Consumed other vertebrates (e.g. Turtles)
- Exception: *Himalayasaurus tibetensis* had large, blade-like tooth crowns

Ichthyopterygia (Ichthyosaurs)

Ichthyosaurs is Greek for “fish lizard”



Drawing of the skull of Ichthyosaurs found by Joseph and Mary Anning. <http://biodiversitylibrary.org/page/48435496>



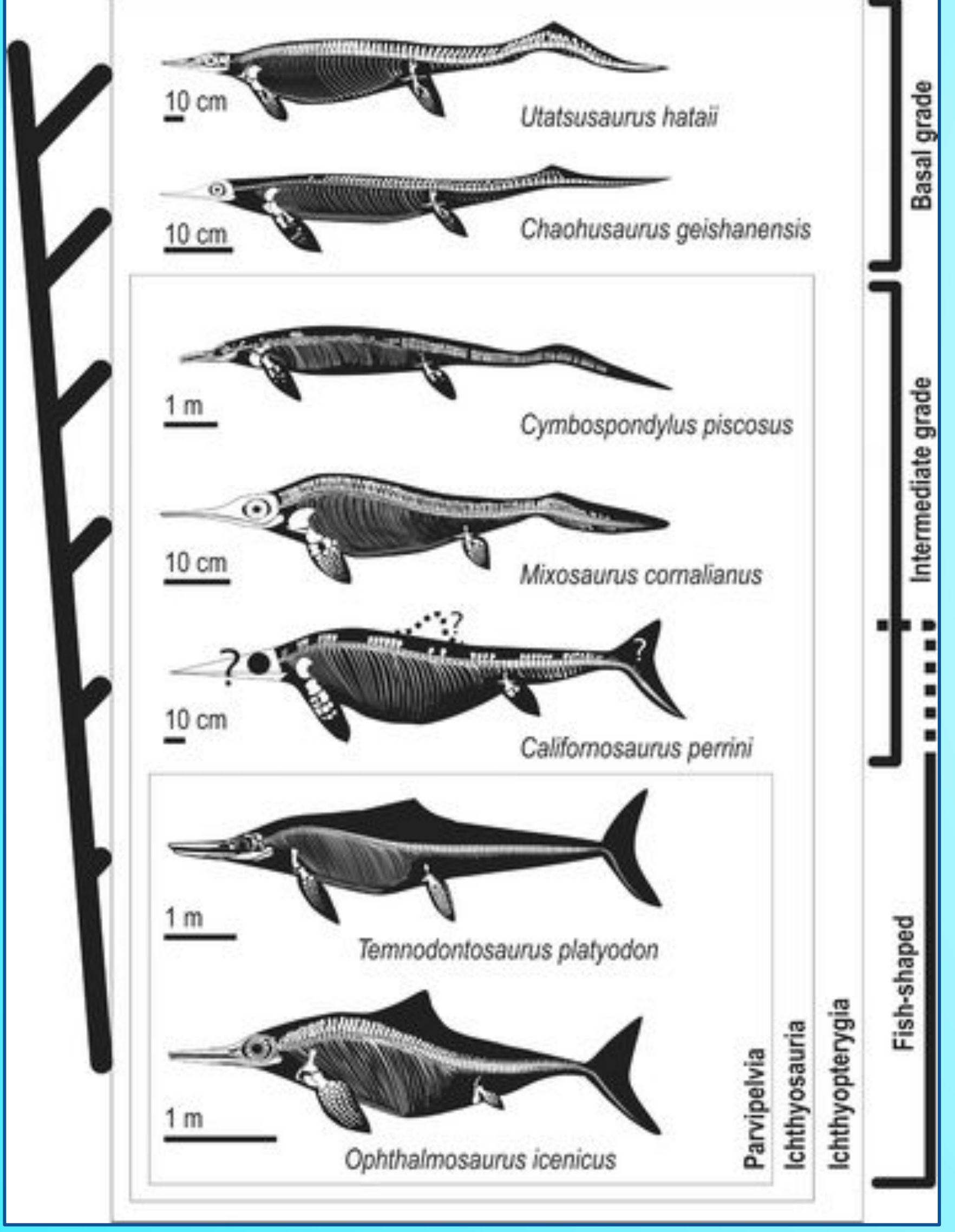
Oil painting of the Late Triassic Shonisaurus by Ron Garrett, <http://oceanofkansas.com/ichthyosaur.html>

Distinctive Features^{3, 5, 7}

- Marine dwelling vertebrae
- Among first diapsids to evolve to life in sea
- Limbs modified as flippers
- Possessed lungs, so swam near surface
- Enlarged eyes
- Long bodies/spine vertebrae swam like an eel
- Crescent shaped tail
- Had live births- but not a mammal
- Distinctively long snout

Variations in Ichthyopterygia Species

<https://www.annualreviews.org/doi/full/10.1146/annurev.earth.33.092203.122707>



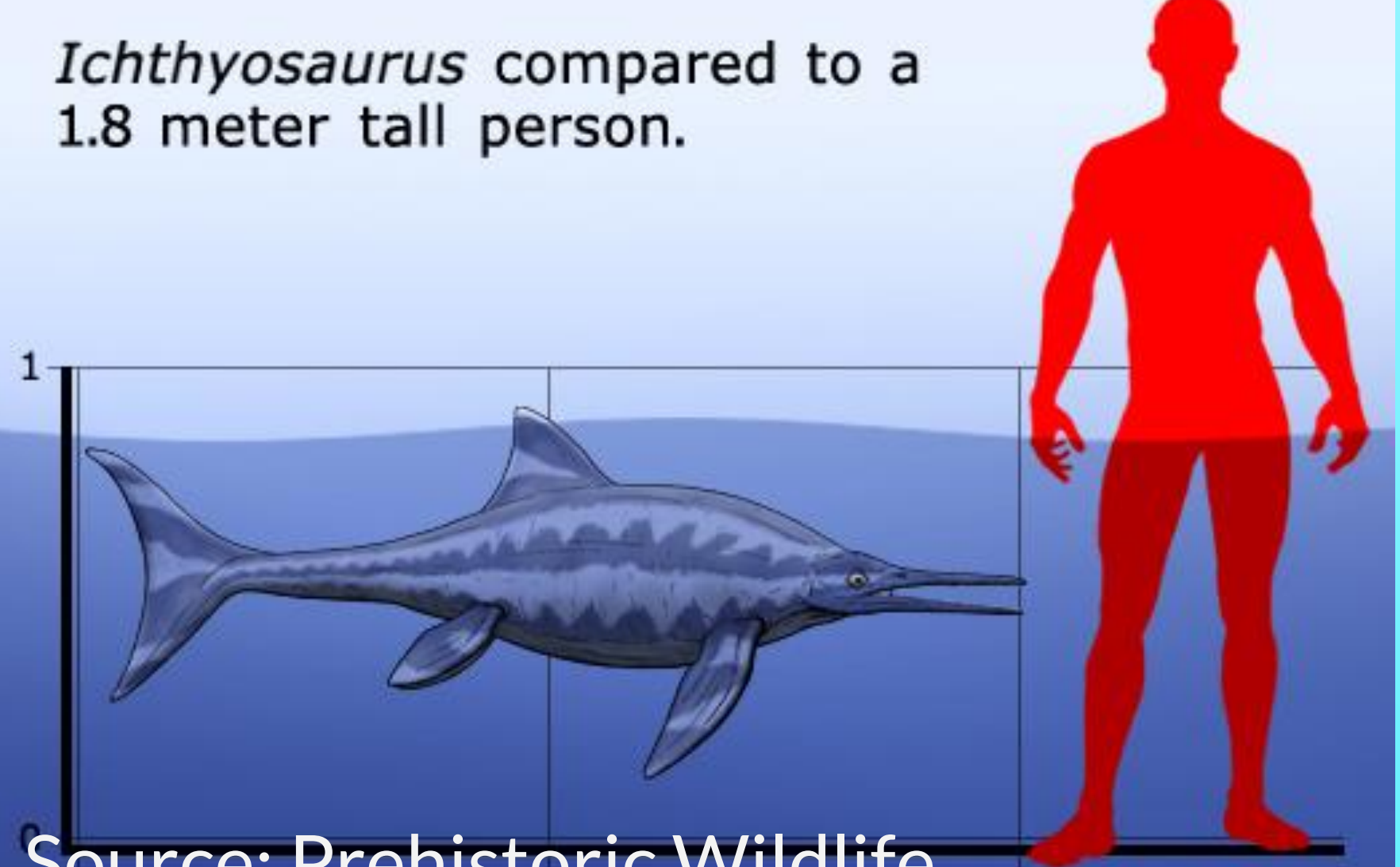
Found in the Mesozoic (250–90 Ma)⁶
 “Golden Age” during Early to Middle Jurassic. Most extinct by end of Jurassic.

Geographic Range²

Ancient Ichthyosaurs are known to have lived around the northern coast of Pangea, specifically Japan, China, Canada, and Norway.

Within the United States, Nevada is the only U.S. state with a complete skeleton.

25 total specimen have been found in Nevada, mostly in the Berlin-Ichthyosaur State Park.



nasal openings external nares located in a posterior position	skull a hydrodynamic, elongated, protruding rostrum
eyes eyes adapted for underwater and low-light vision, and increased pressure environment	teeth a homodont dentition consisting of numerous conical teeth
sleep behavior hemispheric sleep strategy with one part of the brain sleeping at a time	upper forelimb bones short and robust humeri
ears dense and massive auditory ossicles	elbow non-functional (not rotational) elbow joint
neck very short cervical region	finger bones increased number of phalanges in the forelimb (hyperphalangy)
bone structure reduced bone density, increase in spongy (cancellous) bone	front flippers pectoral fins used to steer and balance the animal
dorsal fin fish-like dorsal fin used for stabilizing the body	skin flexible and smooth (scaleless and hairless) skin
spine reduced interlocking of vertebrae	vivipary young born live, underwater, with an innate ability to swim
pelvis reduced pelvic girdle, not attached to the vertebral column	fetal position tail-first instead of head-first delivery
tail increased number of vertebrae, esp. in the caudal region	tail fluke a two-lobed fish-like caudal fluke used for propulsion

Feature comparison: Ichthyosaur to Dolphin <http://www.palaeocast.com/ichthyosaurs/>

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